BIOLOGICAL EVALUATION
PINE ENGRAVER BEETLE IN SECOND GROWTH PONDEROSA PINE
Boise National Forest
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INTRODUCTION

Historically the Boise National Forest has annually suffered what appeared to be excessive losses of second growth ponderosa pine to localized buildups of pine engraver beetles. Most of the tree mortality has been in or adjacent to active timber sales where sizeable volumes of green slash accumulate from early spring through mid summer and logging operations have been suspended (Figure 1).

In 1972, ten groups of new faders were detected in the post logging residual stand in the Trail Creek Timber Sale. On September 8 and 11, a 100 percent cruise was made of these groups to assess the resultant losses.

GENERAL INFORMATION

Insect - Pine engraver beetle, Ips pini(Say)

Host Tree - Ponderosa pine, Pinus ponderosa Laws

Location - Boise Ranger District, Boise National Forest

Type of Damage - Killing of second growth ponderosa pine

Extent of Infestation - Tree mortality to the residual stand was confined to the sale and immediately adjacent vicinity. This area, 80 acres in size, had been selectively marked for commercial thinning with some overstory removal.

BIOLOGICAL INFORMATION

An initial ground evaluation was conducted June 23, 1972. First generation adults, some in the teneral (callow) stage were detected in trees damaged by winter breakage within the cutting unit. A partial flight had occurred as nominal attacks to fresh pine slash were observed (Figure 2). Egg deposition was taking place and larval hatch had begun in some galleries; other

galleries had progressed about an inch in length. At this time there was no evidence of fading or attacks to standing trees.

On September 6, 1972, a second evaluation was initiated at the request of the District Timber Forester. At least eight groups of faders were observed and photographed from a vantage point overlooking the sale area, Figure 3. A resume' of the mid September cruise data follows:

No. of Trees killed	DBH Class (inches)	Ave. Hgt. (feet)	Vol. of Trees killed (bd.ft.)*
256	6	25	-
6	6	48	-
17	7	52	-
22	8	56	-
21	9	54	-
21	10	61	483
10	11	60	370
20	12	67	1300
8	13	73	784
4	14	72	496
4	15	81	672
5	16	73	870
2	18	71	452
1	23	57	182
397			5609

*Computed Scribner Board Foot Volume Formula.

These data show the preference Ips pini has for attacking the smaller diameter trees usually under 10" dbh. Several of the larger trees intended for residual stocking were felled and examined. In most of them a generation had emerged from the top and the lower boles of the same trees were being freshly attacked. No evidence of primary attacks by any Dendroctonus sp. beetles was observed with the exception of the red turpentine beetle, D. valens.

DISCUSSION

Under favorable conditions, as many as four generations of Ips beetles have been recorded on the Boise National Forest. Outbreaks such as the Trail Creek infestation cause damage during the latter part of one season. This was the first attempt to quantitatively analyze Ips damage on the Boise National Forest. To lessen the impact of anticipated losses on this sale, a special C clause stated in the original contract "...that no logging would commence prior to July 1 of any year." The contract was modified and that clause made inapplicable if logging was initiated before July 1, harvesting would continue through August 30. In the past, the first generation flight had been more widely dispersed and had lacked the potential to build to epidemic proportions when fresh logging slash was absent.

An abundance of concentrated food material, high temperatures, low humidity and precipitation are factors conducive to population buildups. Had logging activity not ceased August 2, the perpetuation of fresh slash may have kept the Ips from attacking apparently healthy standing trees. Additional fading was reported in October but not measured. These trees were felled, decked, and burned along with the infested trees detected in the September cruise as part of a post sale thinning program. However, the loss of this stocking constitutes an unscheduled depletion of the intended residual stand.

RECOMMENDATIONS

An increasing number of sales with this type of harvest prescription will be contracted in the future. The average dbh of the harvested ponderosa pine was 19". Slash accumulations predominantly in the form of tops, about 28 per acre, 8 inches or less, were scattered throughout the stand.

Anticipating that the availability of this amount of material is conducive to Ips buildups, the alternatives the land manager may consider to reduce the incidence of standing tree losses are as follows:

1. Remove Infested Material to Specified Landings - Weigh the cost-benefit of additional tree length skidding or unmerchantable piece removal to designated landings for disposal against losses in the residual stand to indiscriminate group tree killing by Ips. Also remove all harvested logs on a current year basis.

2. Specify Applicable Dates for Logging Activity - As previously mentioned, delay cutting of ponderosa pine at least until July 1, and longer when practical, then harvest continuously into the fall. This is a practical approach to reducing the incidence of standing tree losses. Do not curtail logging operations in mid summer nor space cutting units too far apart.

3. Felling and Burning - In the absence of a preventive program against predictable losses, the land manager may consider the alternative of a post logging thinning project. This operation would allow for the removal of infested trees through felling and burning.

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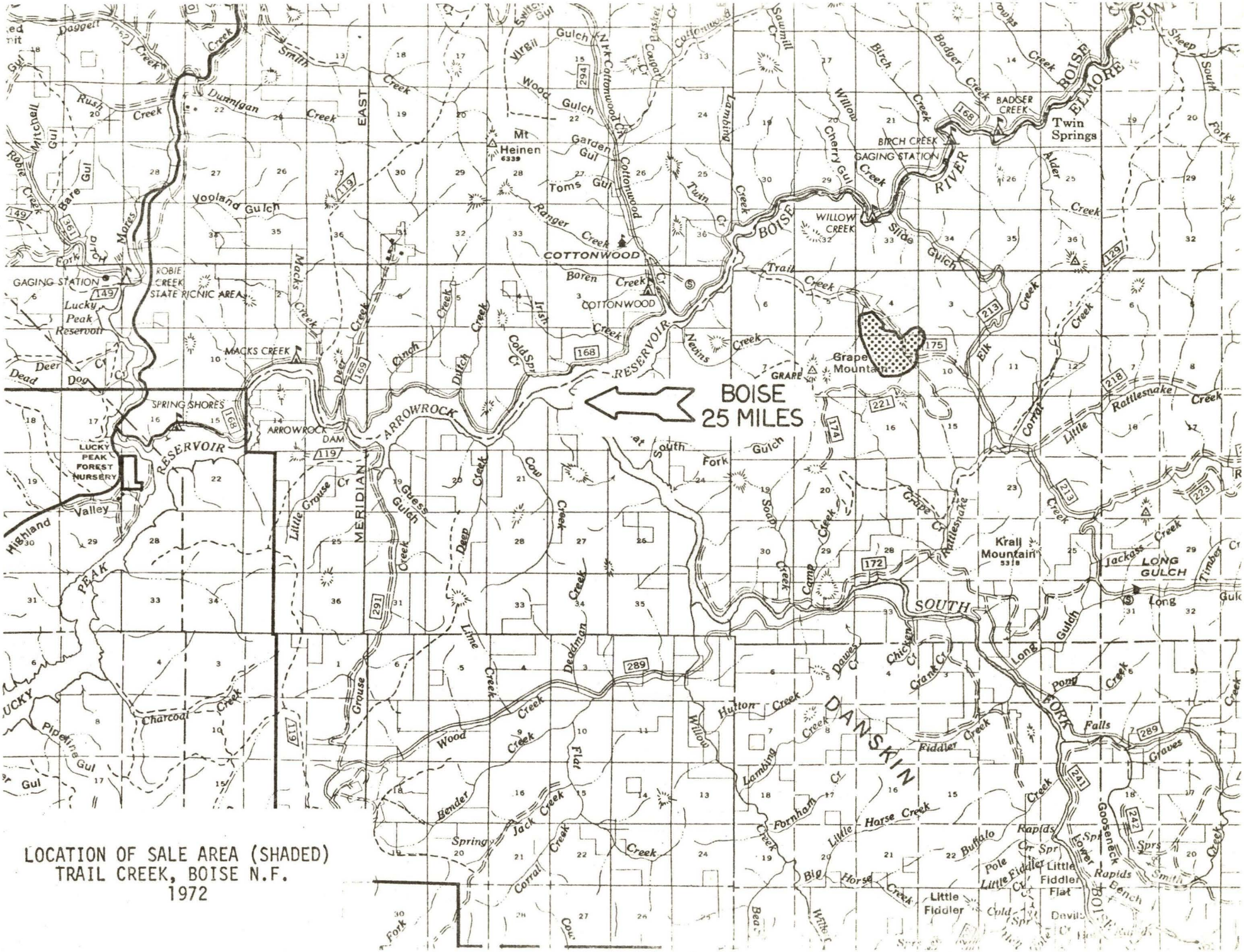
Figure 1. Second growth ponderosa pine under attack by the pine engraver following the Pine Creek Sale, Boise National Forest 1967.

Figure 2. Typical gallery development of Ips pini about 3 days after initial mid-summer attack into fresh ponderosa pine slash. Five female beetles constructing individual egg galleries radiating from nuptial chamber in center.

Figure 3. Varying degrees of fading within the post logging residual stand, Trail Creek, Boise National Forest, 1972.



LOCATION OF SALE AREA (SHADED)
TRAIL CREEK, BOISE N.F.
1972